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## Canadian offshore drilling

Canadian energy companies are pioneering techniques to develop the offshore energy resources of the far north, reports Deborah Shapley in the New York Times, January 15, 1980.

Their attempts to exploit this inhospitable environment reflect the expanding search for energy in areas of the world where drilling once was thought impractical. The far north is believed by some to offer Canada's main hope for energy self-sufficiency late in this decade.

The quest for oil and gas in northern Alaska and northern Canada has largely been confined to land, with some work done from man-made gravel islands in shallow water. But the most promising geological structures lie offshore, where the ice would destroy conventional offshore rigs and platforms.

In Canada, Dome Petroleum Limited and a few other companies have begun to explore these geological structures. The result has been a flurry of technological innovation and adaptation, and some spectacular feats. Oil ships working in "iceberg alley" off the northern coast of Labrador, for example, regularly string cable around icebergs that threaten drillships. The line is pulled taut by two ships, which then maneuver to deflect the berg from its course.

In the Beaufort Sea, where the weather is relatively calm and the water 200 feet deep or less, the main hazard is the pack ice, which can cut a hole in a drillship or destroy the riser, the pipe from the ship to the well.

### Ice monitored by radar

Dome, which has drilled ten offshore wells and hopes to begin production here by 1985, uses an advanced-design ice-breaker and supply ships to chop the moving ice into pieces too small to threaten the drillship. But the ultimate defence is for the drillship to quickly disengage from the wellhead, disconnect the eight anchors that hold the ship in position over the well and move away, trailing anchor cables and riser like a stately octopus. Graham Harrison, a drillship captain, said he can seal a well and leave a site within ten minutes of giving the first command. The anchors left behind are marked by buoys that bob to the surface after the ice has passed, and the ship relocates the wellhead by activat-

ing transponders on it.

Arctic oil operators monitor the ice using airborne radar to "see" the ice through cloud cover and darkness.

### Innovation at gas well

In 1978, another company, Panarctic Oils, demonstrated at Melville Island that an offshore gas well could produce gas without running a pipe to the water surface and thus through the ice. In a \$23-million operation, a gas well was drilled from a rig built on ice that had been built up to three times its normal thickness by repeated flooding and refreezing. The wellhead was lowered through the ice to the sea floor above the well.

Then, a flexible pipeline was constructed onshore about a mile away. A specially built \$600,000 "plow" dug a tunnel through the ground to the sea floor. The plow was withdrawn and the pipeline threaded through the trench by winches to a location near the wellhead, where it was held in great tension. When the tension was released the pipe sprang

towards the wellhead and "docked" with it at a depth of 186 feet.

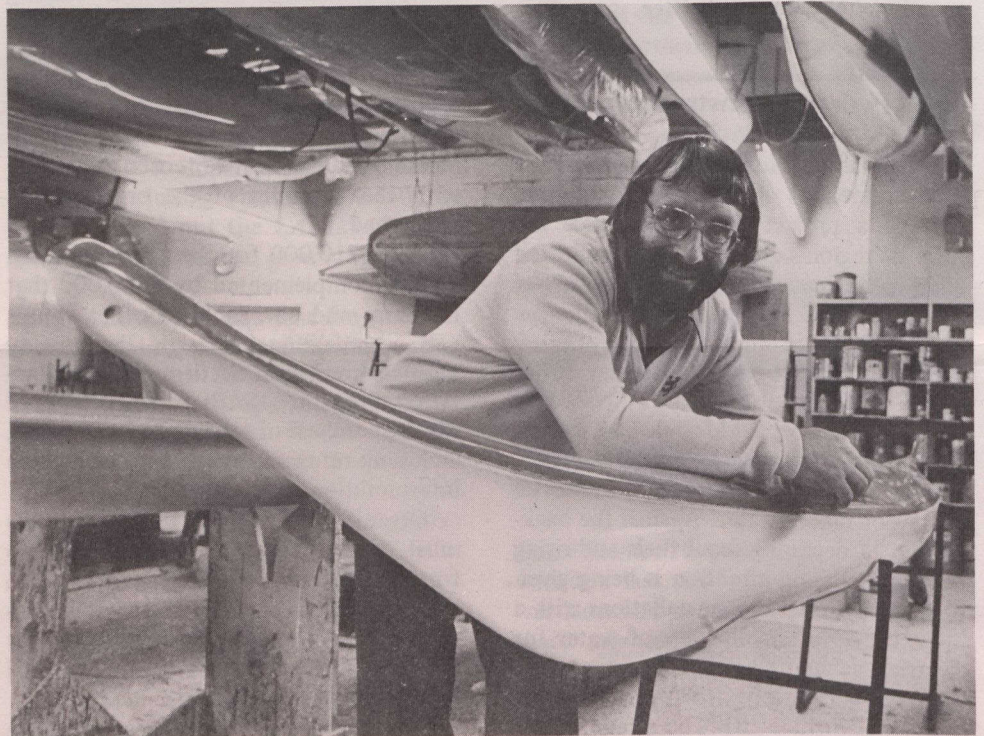
Unlike the Panarctic well, most offshore wells pipe oil or gas to the surface, where tankers can load.

Panarctic, which operates a thousand miles from the North Pole, also demonstrated that divers could work in the Arctic's frigid water. A diver, wearing a special suit that maintained his body at the pressure level of the surface, was able to work for five hours at a depth of 915 feet when the water temperature was 27° Fahrenheit. "He came up in 20 minutes, stepped out, and had a cup of tea," said Charles Hethrington, president of Panarctic. Normally divers must take hours to surface to avoid the "bends".

Since 1969, Panarctic has found 16 trillion cubic feet of natural gas in the northern islands, or 21 per cent of Canada's proven reserves. The Government puts the potential reserves of the Canadian Beaufort Sea, where Dome is operating, at 6.9 billion barrels of oil and 60 trillion cubic feet of natural gas.

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## Briton to teach modern canoe building to the Inuit



*British canoe designer Frank Goodman is visiting Baffin Island to introduce modern methods of canoe building to the Inuit settlement at Frobisher Bay. Mr. Goodman, who led the first kayak expedition round Cape Horn in 1977-78, is pictured in his factory at Nottingham, in the English midlands, where he constructs his glass-reinforced plastic canoes based on the West Greenland Eskimo kayak. He was invited to Baffin Island by Canadian canoeing enthusiast Peter Baril, and will set up a workshop.*